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## (54) PRODUCTION OF PROTON CONDUCTIVE MATERIAL

### (57)Abstract:

PROBLEM TO BE SOLVED: To obtain a proton conductor having excellent proton conductivity and showing no decrease in the proton conductivity even in a dry environment by bringing an acid aq. soln. having specified mol or more concn. of an acid having a group selected from phosphate group, perchlorate group and sulfonate group into contact with a silica nanotube.

SOLUTION: A silica nanotube is impregnated with an acid aq. soln. such as sulfuric acid for 1 to 5 hours under the conditions of  $\geq 0.5$  mol concn. of the acid aq. soln., 20 ml of the contact amt. per 1 g of silica and  $\leq 80^{\circ}\text{C}$  contact temp. to obtain a proton conductor suitable for a fuel cell, capacitor or the like. The silica nanotube is obtd., for example, by adding 1 to 3 mol of water with its pH controlled to 1 to 4 to 1 mol of tetraalkoxysilane to partially decompose the tetraalkoxysilane, adding a surfactant such as a cationic alkylammonium salt by 0.01 to 0.3 mol to 1 mol of the tetraalkoxysilane to the partially decomposed produce, stirring at 10 to 100 rpm, drying a reaction system and calcining at  $600$  to  $700^{\circ}\text{C}$  for 4 to 10 hours.

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